BEACON FEN ENERGY PARK

Planning Inspectorate Reference: EN010151

Waste and Recycling Strategy
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The Planning Act 2008
T The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 - Regulation 5(2)(a)
The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (SI 2017/572) – Regulation 14

Quality information

Prepared by	Checked by	Verified by	Approved by
MF + KW	JB	GS	AK

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1. Waste and Recycling Strategy

1.1 Introduction

1.1.1 This Waste and Recycling Strategy ('the Strategy') has been produced to support the proposed Beacon Fen Energy Park, (the 'Proposed Development').

1.1.2 In particular it considers the aims of national and local policy in regard to commitments to manage resources more efficiently, to prevent/minimise waste, to sustainably manage waste and increase overall recycling rates, diverting materials from entering the waste chain.

1.1.3 This strategy has been prepared as an indicative document which is intended to inform the preparation of Site Waste Management Plan(s) (SWMP) during the construction and decommissioning phases of the Proposed Development SWMPs will be prepared as part of the preparation of detailed Construction Environmental Management Plan(s) and detailed Decommissioning Environmental Management Plan(s) prior to construction and decommissioning of the Proposed Development. For further details relating to the preparation of SWMPs, please refer to Section 5 of **Appendix 2.4 Outline Construction Environmental Management Plan (OCEMP) (Document Ref: 6.3, ES Vol.2, 6.3.7)** and Section 1.12 of **Appendix 2.4 Outline Decommissioning Environmental Management Plan (ODEMP) (Document Ref: 6.3, ES Vol.2, 6.3.8)**.

1.1.4 Within **Appendix 2.1 Scoping Opinion (Document Ref: 6.3, ES Vol.2, 6.3.3)**, rows 2.1.5 and 3.11.9, requested that the Environmental Statement include certain information relating to the waste impacts of the Proposed Development. Sections 4 to 7 of this Strategy provide this information.

1.1.5 To ensure the promotion of good practice and sustainable development, the Developer will seek to ensure that any/all waste generated in developing the Site is minimised or otherwise reused, recycled, recovered or, if necessary, disposed of in accordance with the waste hierarchy.

1.1.6 The waste management hierarchy was introduced by the revised Waste Framework Directive 2008 (Directive 2008/98/EC on waste) and reproduced in national policy prior to, since and including the Resources and Waste Strategy for England 2018. The waste hierarchy is reproduced, below, in order of precedence and will be considered and followed (where appropriate) by the Developer of the Site, having regard to the nature of the waste and any contamination issues.

- **Prevention** – using less material in design and manufacture. Keeping products for longer; reuse and avoiding the waste chain. Using less hazardous materials;
- **Preparing for Reuse** – checking, cleaning, repairing, refurbishing, whole items or spare parts;
- **Recycling** – turning waste into a new substance or product. Includes composting if it meets quality protocols;

- **Other Recovery** – includes anaerobic digestion, incineration with energy recovery, gasification and pyrolysis that produce energy (fuels, heat and power) and materials from waste; some backfilling; and
- **Disposal** – landfill and incineration without energy recovery.

1.1.7 The Strategy aligns with Lincolnshire County Council (LCC), North Kesteven District Council (NKDC) and Boston Borough Council (BBC) policies to ensure waste is managed as high up the waste hierarchy as possible.

1.1.8 The purpose of this Strategy is to demonstrate that Site waste can be managed efficiently and effectively, with opportunities to reduce, reuse and recycle waste materials considered and optimised wherever possible, and to promote best practice and environmental awareness. As such, the purpose of this strategy is to provide an indicative framework to inform the preparation of SWMPs prior to construction and decommissioning of the Proposed Development, as explain in paragraph 1.1.3, above.

2. National Policy Context

2.1 General

2.1.1 The national policy context includes the following:

- Overarching National Policy Statement for Energy (NPS EN-1) (November 2023);
- National Planning Policy Framework (NPPF), last updated 2024;
- National Planning Practice Guidance (NPPG), last updated 2024;
- National Planning Policy for Waste 2014; and
- Our Waste, Our Resources: A Strategy for England, Defra 2018.

2.1.2 The above policy and guidance are considered in greater detail, below, in the context of how the design proposals meet the key objectives of the policies.

2.1.3 Overarching National Policy Statement for Energy (NPS EN-1) [1]

2.1.4 Paragraphs 5.15.1 to 5.15.19 of NPS EN-1 set out policy relating to resource and waste management.

2.1.5 This includes, non-exhaustively, measures for considering the NPPF, National Planning Policy for Waste and wider English waste management strategies in the development of nationally significant energy projects.

2.1.6 Paragraph 5.15.1 of NPS EN-1 states that: '*Government policy on hazardous and non-hazardous waste is intended to protect human health and the environment by producing less waste and by using it as a resource wherever possible. Where this is not possible and disposal is required as a last resort, waste management regulation ensures that waste is disposed of in a way that is least damaging to the environment and to human health*.'

[1] https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1

2.1.7 Paragraph 5.15.2 of NPS EN-1 states 'Sustainable waste management is implemented through the waste hierarchy, which sets out the priorities that must be applied when managing waste. These are (in order):

- *Prevention;*
- *Preparing for reuse;*
- *Recycling;*
- *Other recovery, including energy recovery; and*
- *Disposal*.

2.1.8 Compliance with these policy objectives (or any superseding policies which are in force at the time) will be taken into account when considering the detailed waste management proposals for the construction, operation and decommissioning of the Proposed Development, secured through the preparation of SWMP(s) as part of the detailed CEMP and detailed DEMP.

2.2 National Planning Policy Framework[2]

2.2.1 The NPPF was originally published in March 2012 and replaced all Planning Policy Statements (PPS) and Planning Policy Guidance (PPG). The NPPF was revised in the form of the July 2018 NPPF, the February 2019 NPPF (following consultation), the July 2021 NPPF, the September 2023 NPPF, and now the December 2024 NPPF.

2.2.2 The NPPF sets out the Government's planning policies for England and how they are expected to apply. The NPPF sets out the purpose of the planning system to contribute to the achievement of sustainable development. An overarching presumption in the favour of sustainable development is applied. Principle focus areas of the NPPF cover:

- A strong economy;
- Healthy and safe communities;
- Sustainable transportation;
- High class communications systems;
- Good design;
- Green belt protection;
- Tackling climate change and improving resilience; and
- Conserving and enhancing natural and historic environments.

2.2.3 Waste management is key to a number of these guidance areas, which are key factors in shaping the residential development.

2.3 National Planning Policy Guidance[3]

2.3.1 This online guidance resource, first established in March 2014, identifies the need for Waste Local Plans to drive waste management up the waste hierarchy and identifies that (waste) planning authorities should plan for the sustainable management of waste, including:

- Municipal/household;
- Commercial/industrial;

[2] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[3] https://www.gov.uk/government/collections/planning-practice-guidance

- Construction/demolition;
- Low-level radioactive;
- Agricultural;
- Hazardous; and
- Wastewater.

2.3.2 The guidance sets out what Waste Local Plans must include to ensure compliance with the Waste Framework Directive (2008/98/EC).

2.4 National Planning Policy for Waste[4]

2.4.1 The National Planning Policy for Waste was updated by Ministry of Housing, Communities & Local Government in October 2014. The policy sets out the Government's aim of working towards a more sustainable and efficient approach to resource use and management, including driving waste management up the waste hierarchy.

2.4.2 The policy states that local planning authorities should ensure that during the determination of planning applications for non-waste development:

- New non-waste developments make sufficient provision for waste management and promote good design to secure the integration of waste management facilities with the rest of the development and, in less developed areas, with the local landscape. This includes providing adequate storage facilities ensuring sufficient and discrete provisioning for bins, to facilitate a high quality, comprehensive and frequent collection service; and,
- The handling of waste arising from the construction and operation of development maximises reuse/recovery opportunities and minimises off Site disposal.

2.4.3 With regards the first bullet point, above, there will be no change to the use of the Site post-decommissioning from its pre-existing form and, therefore, no requirements for waste storage and collection are relevant. Adequate waste storage facilities will be made available in the operational phase of the Proposed Development to ensure adherence to facilitate waste management and collections.

2.4.4 The second bullet point relates to ensuring that the waste hierarchy is adhered to wherever possible. It is anticipated that targets will be set for waste reduction and recovery based upon an assessment of the composition and quantity of waste arising and identification of the most significant cost-effective options for improvement. This may be supplemented by information detailing how the targets will be achieved during construction of the Proposed Development and how actual levels of waste reduction/recovery will be monitored in comparison with the targets set.

2.5 Resources and Waste Strategy for England[5]

2.5.1 The Our Waste, Our Resources: A Strategy for England was published in 2018, replacing the previous 2013 waste strategy (Waste Management Plan

[4] https://www.gov.uk/government/publications/national-planning-policy-for-waste
[5] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/765914/resources-waste-strategy-dec-2018.pdf.

for England), and sets out the Government's direction in waste management whilst incorporating core principles including the waste hierarchy, resource efficiency and circular economy.

2.5.2 The 2018 Strategy sets out how to preserve the stock of material resources by minimising waste, promoting resource efficiency and moving towards a circular economy. It also details how to minimise the damage caused to our natural environment by reducing and managing waste safely and carefully, and by tackling waste crime.

2.5.3 The circular economy vision included in the 2018 Strategy emphasises the need to maximise the life and value of resources used. Specific to construction and excavation wastes it looks at developing offsite manufacture, use of innovative construction materials and techniques and resource efficiency by using available materials where suitable for the intended application. This includes supporting the work of the Green Construction Board.

2.6 Waste Framework Directive 2008/98/EC[6]

2.6.1 The Waste Framework Directive 2008/98/EC15 ('Waste Directive') provides a framework for the management of wase across the European Community. The Waste (England and Wales) Regulations 2011 (as amended) transposed the Waste Framework Directive into domestic law in England and Wales. The framework requires waste prevention programmes and waste management plans that apply the 'waste hierarchy') and also includes details on the "End of Waste" status, defining when a recycling or treatment process has been completed. The Waste Framework Directive also specifies how Wastes are defined, framed in a standard Code of Practice. The Waste Framework Directive, and the resultant waste hierarchy forms the basis of many other waste strategies at the national and local level that are referenced in this text.

3. Local Policy Context

3.1 General

3.1.1 The following section details the guidance and development policy provided at a local level.

3.2 Central Lincolnshire Local Plan (2023)[7]

3.2.1 ***Objective 10*** *– "Waste: To minimise the amount of waste generated across all sectors and increase the re-use, recycling and recovery rates of waste materials."*

3.2.2 ***Policy S10*** *– "Supporting a Circular Economy: Proposals will be supported, which demonstrate their compatibility with, or the furthering of, a strong circular economy in the local area."*

[6] https://www.legislation.gov.uk/uksi/2011/988/contents
[7] https://www.n-kesteven.gov.uk/Sites/default/files/2023-04/Local%20Plan%20for%20adoption%20Approved%20by%20Committee.pdf.

3.2.3 ***Policy S53*** *– "Design and Amenity: All development proposals will…*

- *provide adequate storage, waste, servicing and utilities for the use proposed;*
- *minimise the need for resources both in construction and operation of buildings and be easily adaptable to avoid unnecessary waste."*

3.3 Lincolnshire Minerals and Waste Local Plan (2016)[8]

3.3.1 The strategic objectives of the Lincolnshire Minerals and Waste Local Plan are as follows:

- *"Protect the environment and local communities from negative impacts of minerals and waste development, reduce residual impacts and deliver improvements where possible. Ensure new facilities include high standards of design and layout, sustainable construction methods, good working practices and environmental protection measures;*
- *Through prioritising movement of waste up the waste hierarchy, minimise greenhouse gas emissions by reducing the reliance on landfill; maximise opportunities for the re-use and recycling of waste; facilitate new technologies to maximise the renewable energy potential of waste as a resource; and promote the use of carbon capture technology; and*
- *Deliver adequate capacity for managing waste more sustainably when it is needed; to ensure waste is managed as near as possible to where it is produced, including the need for waste water infrastructure;"*

3.3.2 ***Policy DM1*** *– "Presumption in favour of sustainable development: When considering development proposals, the County Council will take a positive approach that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. It will always work proactively with applicants jointly to find solutions which mean that proposals can be approved wherever possible, and to secure development that improves the economic, social and environmental conditions in the area. Planning applications that accord with the policies in this Local Plan will be approved without delay, unless material considerations indicate otherwise. Where there are no policies relevant to the application or relevant policies are out of date at the time of making the decision then the County Council will grant permission unless material considerations indicate otherwise – taking into account whether:*

- *Any adverse impacts of granting permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole; or*
- *Specific policies in that Framework indicate that development should be restricted."*

[8] https://www.lincolnshire.gov.uk/downloads/file/2361/core-strategy-and-development-management-policies.

3.4 South East Lincolnshire Local Plan 2011-2035 (2019)[9]

3.4.1 ***Policy 3*** *– "Design of New Development: Development proposals will demonstrate how the following issues, where they are relevant to the proposal will be secured:*

- *The provision of facilities for the storage of refuse/recycling bins, storage and/or parking of bicycles and layout of car parking"*

3.5 Joint Municipal Waste Management Strategy (JMWMS) for Lincolnshire (Adopted 2019)[10]

3.5.1 The JMWMS has been developed in-line with National Planning Policy for Waste, including the waste hierarchy and sets out how the members of the Lincolnshire Waste Partnership (LWP) will work in partnership to deliver sustainable waste management services and to establish best value waste management practices for the benefit of Lincolnshire. The LWP's vision for the strategy is "*to seek the best environmental option to provide innovative, customer-friendly waste management solutions that give value for money to Lincolnshire*". The 10 objectives of the 2019 Strategy are as follows:

- **Objective 1**: To improve the quality and, therefore, commercial value of our recycling stream;
- **Objective 2**: To move towards a common set of recycling materials;
- **Objective 3**: To consider the introduction of separate food waste collections where technically, environmentally and economically practicable;
- **Objective 4**: To explore new opportunities of promoting waste minimisation and of using all waste as a resource in accordance with the waste hierarchy;
- **Objective 5**: To contribute to the UK recycling targets of 50% by 2020 and 55% by 2025;
- **Objective 6**: To find the most appropriate ways to measure our environmental performance, and set appropriate targets;
- **Objective 7**: To seek to reduce our carbon footprint;
- **Objective 8**: To make an objective assessment of what further waste processing/disposal capacity is required and, as necessary, secure appropriate capacity;
- **Objective 9**: To regularly review the LWP governance model in order to provide the best opportunity to bring closer integration and the implementation of the objectives set by the strategy; and
- **Objective 10**: To consider appropriate innovative solutions in the delivery of our waste management services.

[9] [redacted]
[10] https://www.lincolnshire.gov.uk/downloads/file/3156/strategic-environmental-assessment-environmental-report-pdfa

4. Consultation

4.1.1 The following response has been provided for two statutory stakeholder comments, and is summarised below, to support and justify the scoping out of a full waste assessment as part of the Environmental Statement and to address the additional information requested in **Appendix 2.1 Scoping Opinion (Document Ref: 6.3, ES Vol.2, 6.3.3)**:

Environment Agency

- *"We support your intention to produce a DEMP and a Waste & Recycling Strategy alongside the ES. NPS EN-1 requires that information be included on how re-use and recycling will be maximised in addition to the proposed water recovery and disposal for all waste generated by the development. This should include assessment of the impact of waste arising from development on the capacity of waste management facilities to deal with other waste arising in the area."*

4.1.2 Section 6 sets out a response to the waste streams and the impact of waste on wider facilities. . For specialist waste streams, such as solar panels, batteries and other wastes generated, Section 6.3 and this Section 4 discuss the management and implications of solar panel and battery recycling on a wider scale.

Lincolnshire County Council

- "Further consideration and more detailed assessment of the likely waste streams and how they will be managed will be required in respect of construction and operation waste, particularly in light of:
  - The panel turnover forecasted for other Sites,
  - The current lack of facilities locally for processing end of life panels, and
  - The cumulative arisings from all solar NSIPs."

4.1.3 The Applicant addresses these considerations in sections 5.2 to 5.3 of this Strategy, which confirm that such matters are not considered likely to give rise to any significant effects.

4.1.4 Solar panels are typically designed with a 40-year lifespan, although it is appreciated, that there will be some variation dependent on type and manufacture.

4.1.5 The same would apply to arisings from other solar NISPs locally, and therefore the cumulative impacts of this waste stream are likely to be a negligible number over an operational lifetime of 40 years.

4.1.6 The specific cumulative arisings from other solar NSIPs locally are unknown at this stage, due to variation in staffing numbers, and the degree of construction and decommissioning wastes expected to be generated by other Sites but is not anticipated to be significant due to anticipated low volumes, and the number and approximate capacities of suitable waste facilities in Lincolnshire (as part of a review in WasteDataInterrogator). This also assumes

that other solar NSIPs will also implement SWMP of their own to reduce wastes. This is discussed in Section 4 and Section 6.

4.1.7 The lack of facilities locally able to accept solar panels for recycling is considered at a national level and is discussed in Section 6.3 and Section 7 of the Strategy.

4.1.8 At present, whilst offtakers such as Recycle Solar (based in Scunthorpe) and PV CYCLE exist within the UK market for accepting solar panels, none currently process the materials beyond initial shredding and metal separation within the UK. The majority of recyclers will currently export to the EU for further reprocessing or directly operate within Europe. This situation with regards to facilities is likely to evolve in the next 5 - 10 years based upon market movements and equipment costs; and as more solar panels approach the end of their lifetimes in the next two decades, the demand for UK recycling capacity is likely to grow.

4.1.9 This market's small scale, as well as the lack of data means at this time, it is challenging to accurately calculate offtaker capacity for solar panel recycling. However, it is likely that in 20 to 40 years this will evolve as capacity grows to reflect the requirements of the wider solar market. The removal of panels would be managed in a phased approach and transported only when offtakers are able to safely store the panels and process them at a sustainable rate.

4.1.10 The risk is considered to be small in relation to finding outlets for recycling the panels upon decommissioning, and waste volume impacts on the local waste management infrastructure is expected to be negligible.

- *"Operational waste could also be a significant waste stream which needs careful consideration. The PEIR at paragraphs 2.14.6 and 2.14.8 refers to waste being recycled or disposed of in accordance with good practice and market conditions at the time. The developer should aim to minimise and reuse waste wherever possible in accordance with the waste hierarchy. The waste management proposals need to ensure that the waste hierarchy principles are followed and more detailed plans should demonstrate how this will be achieved."*

4.1.11 Further response has been made to this comment as part of Section 1.16 (Hierarchy), Section 5 (Site Design) and Section 7 (Waste Streams). Operational waste is predominantly expected to be made up of recyclable materials, such as metal, as well as some WEEE waste streams, such as batteries and electrical switchgear and small amounts of municipal type wastes generated by Site staff.

4.1.12 All relevant legislation will be followed in processing these wastes, and wherever possible, the waste hierarchy will be applied to ensure wastes are kept as high up the waste hierarchy as possible (as also discussed in Section 1).

4.1.13 Owing to the growth in the battery recycling market, and an expanding market for recycling solar panels (being able to be broken down into metal, silicon and plastic recycling streams), it is likely that throughout the operational phase and decommissioning phase, the limited tonnages of battery and solar panel waste

anticipated to be generated, will be matched by a growth in recycling capacity for these material streams.

4.1.14 The construction phase of the Proposed Development is unlikely to lead to significant impacts on landfill / treatment capacity in combination with other cumulative schemes (nearby NSIP Solar developments) due to the limited period of activity and given that measures will be in place to avoid and minimise waste. Combined waste streams from cumulative schemes during the construction phase are therefore unlikely give rise to significant impacts on landfill capacity.

4.1.15 Waste volumes generated during the operational phase of the Proposed Development will be low. As such, it is unlikely that combined waste streams from cumulative schemes during the operational phase will give rise to significant impacts on landfill or treatment capacity.

4.1.16 Assuming that waste is handled appropriately, no significant cumulative effects are anticipated.

4.1.17 As such, operational waste is not deemed to be a significant factor.

5. Site Design

5.1 General

5.1.1 The detailed design of the Proposed Development will seek to minimise and design out waste streams where possible. Opportunities to re-use materials within the Site will be sought where practicable. For example, soil that is excavated from trenches, roads, compound areas and foundations will be re-used wherever possible within the Site.

5.1.2 Where re-use and prevention are not possible to ensure materials avoid the waste chain, waste arisings will be managed in line with the waste hierarchy as secured by **Appendix 2.4 Outline CEMP (Document Ref 6.3, Vol.2, 6.3.7)**, and **Appendix 2.5 Outline DEMP (Document Ref 6.3, Vol.2, 6.3.8)**.

5.1.3 Commercial waste generated during all stages of the Proposed Development will be managed in accordance with producers' legal responsibilities in place at the time. Waste will be managed by permitted waste carriers and facilities in line with the appropriate environmental permits and requirements.

5.1.4 The detailed construction site design will be secured through the DCO, which will consider safe and efficient material use via an SWMP as part of the detailed CEMP. The site design will consider waste storage and collection during the construction phase, as well as in the longer-term waste storage during the operational phase. The Site will be designed to optimise material use, recycling and reprocessing whilst also meeting high standards for environmental and waste management.

5.1.5 Owing to the nature of the Proposed Development, operational waste generation will be low and associated with the maintenance of the Site and the staffing arrangements. The Proposed Development will include the necessary infrastructure to store and manage generated waste through good

design, to ensure that waste reduction, reuse and recycling is made as easy as possible for workers on the Site during operation.

5.1.6 The Site will be designed to include the provision of sufficient space for bins, including recycling, and ensure the internal road layout of the Proposed Development is appropriate for refuse vehicles to safely manoeuvre when collecting waste.

5.1.7 In accordance with national and local policy, the aim of the Site design will be to ensure that there is sufficient provision for recycling and that (wherever possible) waste management facilities are integrated into the scheme so that their impact is minimised. The Proposed Development will generally consider the following:

- The principles of 'designing out waste' to identify waste reduction opportunities;
- WRAP's (Waste and Resources Action Programme) 'Choosing Construction Products' for guidance on materials recycled content;
- Selection of robust and durable construction materials, sourced from reputable suppliers;
- Reduction in waste generation during Site clearance, earthworks, Site preparation and construction through appropriate design;
- Materials specifications that encourage the use of reused or recycled products, material from sustainably management sources and materials that are suitable for reuse or recovery without significant environmental impact;
- Use of aggregates that are derived from recovered materials rather than virgin aggregates (wherever feasible);
- Reuse of excavated materials onsite (wherever feasible); and
- Techniques to encourage segregation of materials for recycling.

5.2 Solar Panels

5.2.1 Solar panel life cycle considerations have been included as part of **Chapter 12 Climate Change (Document Ref: 12 ES Vol.1, 6.2.12)**, including anticipated embodied carbon estimates. Solar panel turnover is anticipated to be negligible, due to the design and approach selected, and it is unlikely that during the lifetime of the facility a significant number of panels will need to be replaced. Based on current data, it is typically expected that solar panels have a lifetime of 40 years.

5.2.2 At the end of life, solar panels will be recycled through relevant waste contractors wherever possible.

5.2.3 Whilst few offtakers currently exist for solar panels in the UK, efforts will be made by the operator of the Proposed Development to identify and establish relevant contractors who are able to transport and repurpose solar panels that reach the end of their life, and/or recycle the components of the solar panels selected for the Proposed Development.

5.2.4 The number of contractors with the technical ability and capacity to recycle solar panels is growing across the UK and Europe. It is therefore probable that at any point when any of the Proposed Development's panels require to be replaced, and by the decommissioning phase of the Proposed Development,

that a number of suitable offtakers will exist in the UK for the treatment and recycling of solar panels generated by the Proposed Development (with intermediate hazardous waste transfer stations able to manage solar panels for onward transport to such facilities). Such arrangements will be managed throughout the lifetime of the facility by the operator as part of the SWMP.

5.2.5 Whilst a number of solar farms are present in Lincolnshire, it is likely that with the anticipated staggered timeframes for the decommissioning of such facilities, any offtakers will be able to manage materials from such facilities accordingly and in line with market capacity. It is typically expected that the solar panels have a lifetime of 40 years, with a failure rate of 0.2% per year that cumulatively, is unlikely to be significant.

5.3 Batteries

5.3.1 The Proposed Development will comply with the Waste Batteries and Accumulators Regulations (2009) and Waste Electrical and Electronic Equipment Regulations 2013 with regards to the use of batteries used on the Proposed Development.

5.3.2 Wider producer responsibility legislation was introduced in 2014 as part of the EU Waste Electrical and Electronic Equipment Regulations (2013), and the guidance has been most recently updated in March 2025. In compliance with these Regulations, the Applicant will work with a relevant Producer Compliance Scheme (PCS) to return batteries so they can be recycled and managed appropriately, in line with the regulations.

5.3.3 Under the Regulations, industrial battery producers supplying batteries to the Proposed Development are obliged to:

- Take back waste industrial batteries from end users or waste disposal authorities free of charge and provide certain information for end users;
- Ensure all batteries taken back are delivered and accepted by an approved treatment and recycling operator;
- Keep a record of the tonnes of batteries placed on the market and taken back; and
- Report to the Secretary of State on the weight of batteries placed on the market and collected in each compliance period (each 12 months starting from 1 January).

5.3.4 Batteries have potential to cause harm to the environment due to the chemical composition used in typical battery storage arrangements, and as such the battery storage area of the Site is designed appropriately to ensure containment of faulty/leaky battery units, as well as ensure replacement when a faulty component is identified.

5.3.5 Waste batteries, anodes and cathodes will be managed under Hazardous Waste Consignment Notes and appropriately managed by waste contractors when removed.

5.3.6 Wider battery management will be undertaken in accordance with a Battery Safety Management Plan which will be produced prior to the installation of batteries on Site and must be substantially in accordance with the **Outline**

Battery Safety Management Plan (Document Ref 7.2, Vol.2) , as secured through a requirement in Schedule 2 to the **Draft DCO (Document Ref: 3.1)**.

5.3.7 When a battery within a battery storage unit ceases to operate, it be removed from the Proposed Development. The party discarding the battery will be licenced to do so under Duty of Care and will manage the waste in accordance with Environmental Permitting regulations.

5.3.8 Batteries will be recycled or recovered by approved battery treatment operators or exported for treatment by approved battery exporters only, in line with the Waste Batteries and Accumulators Regulations 2009.

5.3.9 During both the operation and decommissioning of the Proposed Development, it is likely that batteries will be recycled through offtakers beyond the region, with intermediate storage at a local Hazardous Waste Transfer Station being able to support the movement of such wastes. Such arrangements at the operational phase and decommissioning phase, will be managed as part of the SWMP, which will be managed as part of processes outlined in the detailed CEMP and detailed DEMP.

6. Site Preparation and Access

6.1 General

6.1.1 The preparation phase is anticipated to include the following:

- Clearance of existing vegetation (where required);
- Ground-levelling;
- Excavation (required for foundations and cabling, etc.);
- Removal of any fly-tipped waste (to suitable material recycling facilities);
- Fencing and Site security (to prevent unauthorised access); and

6.1.2 It is also anticipated to include the installation of suitable portacabin/welfare facilities (to be erected ready for construction to commence).

6.1.3 Where possible, it is expected that any excavated material will be reused on the Proposed Development, rather than removed. It is anticipated that subsoils will be stockpiled ready for reuse in Site engineering and earthworks.

6.1.4 Where wastes require removal from Proposed Development, suitable access arrangements are expected to be put in place to ensure that contractor vehicles can easily and safely access areas where waste materials are stored and empty containers for onward processing, recycling, or disposal.

6.1.5 Any hazardous waste identified during the Site preparation phase, inclusive of landscaping, such as waste oils and asbestos, will be handled and disposed of in a safe and appropriate manner using specialist contractors.

6.1.6 As far as practicable, removal of waste during the construction phase will be scheduled to avoid peak traffic times

6.2 Site Access during Operation

6.2.1 Consideration will be given to the access requirements of collection vehicles to ensure that they can easily and safely access areas where waste materials are stored and empty containers for onward processing, recycling or disposal. A clearly designated route will be indicated from the public highway to the storage areas on the Proposed Development and this will be designed to be safe and viable for the anticipated collection vehicle types where relevant. There will be sufficient space for the anticipated collection vehicles to manoeuvre and the containers will be selected in partnership with the collecting authority and private contractors to ensure that they are compatible and can be unloaded safely and efficiently. The containers will be stored away from parking areas and away from the area(s) where other vehicles will be required to manoeuvre.

6.2.2 Suitable collection frequencies are expected to be agreed with the collection contractor/local authority and the storage containers sized appropriately to ensure provision of adequate storage capacity, to optimise the collection frequency and to avoid waste materials being stored onsite for prolonged periods.

6.2.3 Should the need arise for additional storage capacity (e.g., if large quantities of materials are consistently produced), the inclusion of provisions for a static waste compactor, baler, crusher or additional suitable storage vessels will be considered.

6.2.4 The full details of all site preparation and access specifications, where relevant to waste, will be detailed in the SWMP prepared as part of the detailed CEMP.

7. Waste Streams

7.1 Construction Phase

7.1.1 It is noted that large-scale earthworks are not anticipated for the Proposed Development. The electrical infrastructure, including PV modules, will be manufactured offsite and delivered for installation when required. Earthworks for the onsite substation, BESS, transformers and inverters will be required, as well as that of the access road but are broadly expected to be developed from cut and filled soils or imported into the Site. Therefore, the Proposed Development construction phase waste from earthworks leaving the Site is anticipated to be minimal.

7.1.2 Any materials that are generated during construction are likely to include inert construction materials, as well as packaging (e.g. wood and plastic) and materials generated during such activities.

7.1.3 The types of wastes generated during construction are likely to comprise:

- General waste from Site offices and welfare facilities;
- Small quantities of waste from the maintenance of construction vehicles;
- Packaging waste from incoming materials; and

- Other waste from construction of fencing, access roads and other supporting infrastructure.

7.1.4 Waste materials will be disposed of by the contractor to appropriate recycling facilities or, as a last resort, appropriately licensed landfills.

7.1.5 It is the intention that, where possible, any excavation materials will be reused onsite for landscaping and all other materials will be segregated and stored for onward processing and recycling as a priority.

7.1.6 Contaminated soils that cannot be reused onsite will be disposed of in an appropriate landfill. The appropriate landfill for disposal will depend on the waste classification determined from the chemical analysis or Waste Acceptance Criteria testing as necessary.

7.1.7 The Applicant will seek to minimise waste through the supply chain, specifying the use of reusable (or returnable) packaging for materials delivered to Site and programming material delivery wherever possible. This will help to reduce the amount of packaging that can typically be generated during the construction period. All incoming packaging that requires storage onsite prior to offsite recovery can be segregated and stored under cover in clearly identifiable areas. This may include segregation of card, paper, wood, hard plastics and plastic film.

7.1.8 With review of local waste management facilities via WasteDataInterrogator, it is expected that sufficient capacity exists in the local area that would be able to accept such waste generated through construction works.

7.1.9 Table 7-1 Estimated Construction Waste Arisings, below, contains estimated arisings from workers on Site during the construction of the facility per annum.

7.1.10 A calculation has been undertaken to estimate the anticipated waste arisings from staff during the construction of the Proposed Development by using an approximate benchmark for office/welfare waste, and assuming the peak of staff deployment spread across the year. Approximately 169 tonnes per annum of welfare waste is anticipated. Owing to being only 169 tonnes per annum, and the waste facilities typically accepting such waste in Lincolnshire being plentiful (including Material Recycling Facility (MRF), energy recovery and composting facilities), this number is considered to have a negligible impact upon waste management facilities dealing with waste arisings in the local and regional area.

7.1.11 This tonnage has been assumed based on a worst-case scenario of staffing numbers, as often staff numbers will be below c.417 FTE at any given time, and the tonnage of waste per annum figure is provided as an indicative outline of typical staff waste volumes.

7.1.12 Wider waste volume generation for the Proposed Development during construction is estimated to be negligible, due to the small number of structures set to be constructed, and the fact that solar panel installations and battery installations are being prefabricated offsite.

Table 7.1: Estimated Construction Waste Arisings

SITE	DEVELOPMENT TYPE	FORMULA	SIZE OF CONCERN	WEEKLY WASTE ARISING (LITRES)	M^3 ANNUM (*52/1000)	TONNAGE OF WASTE PER ANNUM (*0.26)
Beacon Fen- Total	Office/Welfare	Volume arsing per employee of floor area [50l] × number of employees	No of employees =417*	20,850	1,084.2	281.89
Total				20,850	1,084.2	281.89

* Based upon total net construction employment, as estimated within Chapter 15 Socio Economic (Document Ref: 6.2 ES Vol.1, 6.2.15)

7.2 Operational Phase

7.2.1 Owing to the nature of the Proposed Development, waste generation during the operational phase is anticipated to be minimal) and will not have a significant impact upon the local and regional waste management infrastructure.

7.2.2 The likely waste to be produced from the operation / maintenance of the Proposed Development will be associated with potential equipment / panel replacements and workers carrying out onsite maintenance, which might include packaging, dry recycling, residual waste and potentially food waste.

7.2.3 As maintenance activities are expected to be limited, it is anticipated that operational waste will be negligible in impact upon local waste capacity based upon an initial review in WasteDataInterrogator. Solar panel recycling and arisings are expected to require management through specialist waste management contractors, which may fall outside of the immediate local area, and are as described, with the associated impacts, in Section 7.3 and below.

7.2.4 To manage the solar panel waste that will arise from potential panel replacements during the 40-year operational life of the Proposed Development, there will be a regular review of suitable outlets for reuse and recycling of the panels and associated infrastructure at the end of its viable life to maximise recycling. This is likely to be across offtakers in England, and if required, in Europe.

7.2.5 It is not likely that a significant number of solar panels will need to be replaced throughout the development lifetime, with only ad-hoc replacements following damage, being probable, based on the experience of other solar farms across England. It is typically expected that solar panels have a lifetime of 40 years with a failure rate of 0.2% per year.

7.2.6 If any of the associated equipment such as transformers, inverters and switchgear required replacement throughout the operational phase, these are also likely to be recycled.

7.2.7 Solar panel treatment and recycling is anticipated to be a sector that will be expanding throughout the lifetime of the facility, as a growing number of offtakers exist within the UK, as well as for the batteries used by the Proposed Development.

7.2.8 Battery waste, as well as the management of inverters and electrical grid infrastructure, is likely to be feasible via specialist WEEE waste providers, who will be able to support the recycling of such waste streams across England. Reuse will be explored where possible as part of other grid-scale BESS schemes.

7.2.9 There is potential for airborne litter to leave the Proposed Development, but this will be limited by the provision of suitable litter bins at appropriate locations onsite, with a Site induction instructing all Site visitors of best waste management practices.

7.3 Decommissioning Phase

7.3.1 As the lifespan of the Proposed Development is anticipated to be 40 years, it is not possible (at this stage) to identify either the waste management routes or specific waste facilities to be utilised during the decommissioning of the Proposed Development. **Appendix 2.5 ODEMP (Document Ref 6.3, Vol.2, 6.3.8)** has been submitted as part of this DCO Application. A requirement in Schedule 2 to the **Draft DCO (Document Ref: 3.1)** secures that, prior to decommissioning, a detailed Decommissioning Environmental Management Plan (DEMP or DEMP(s), if the Proposed Development is decommissioned in different parts) must be prepared for approval by the relevant planning authority, which must include a decommissioning traffic management plan and SWMP. The detailed DEMP must be substantially in accordance with **Appendix 2.5 ODEMP (Document Ref 6.3, Vol.2, 6.3.8)**. Any waste generated from decommissioning at the end of life will be managed in accordance with the SWMP(s) prepared as part of the detailed DEMP(s).

7.3.2 Owing to the nature of the solar panels and batteries kept onsite, it is anticipated that such wastes may need to be transported to specialist facilities (via a waste transfer station if required, and via a phased removal to ensure manageable throughput) able to reuse or recycle the components of the solar panels and battery units. It is expected that other structures erected onsite expected to be decommissioned (predominantly constructed from composite, metal and concrete) will be treated locally or will be reused and are not expected to have a significant impact upon local waste management facilities and waste capacity.

7.3.3 Through the SWMP, the decommissioning phase will be programmed in such a manner as to allow sustainable throughput at the appropriate treatment facility for the materials managed. This will be managed in consideration of any other potential decommissioning works at other NSIPs in the region, and a plan updated throughout the lifetime of the facility.

7.3.4 Whilst at present a lack of facilities exist locally for treating solar panel and battery wastes, the situation will be re-assessed at the point of decommissioning, and it is anticipated that intermediate transfer stations could be utilised to facilitate onward transfer to treatment facilities based across the UK.

7.3.5 It is considered probable that with market growth in the solar sector alongside existing facilities already recycling solar panels and batteries, there will be relevant facilities able to treat and recycle solar panel and battery wastes from the Proposed Development, within the UK, at the point at which it is required.

7.3.6 Cumulative effects from other solar NSIPs, as referred to in paragraph 4.1.6 of this Strategy, are concluded to be negligible.